

Sem 2 Exam Review

© 2012 Kuta Software LLC. All rights reserved.

Simplify each expression.

1) $(3 - 3x^4 + x^2) + (2x^3 - 2x^2 + 3x^4)$

2) $(4p - 3p^2 + 3p^4) - (p + 4p^4 - 8p^2)$

State the degree and leading coefficient.

3) $6m^2$

4) $-8x^5$

Factor each completely.

5) $128 - 2x^3$

6) $64 + 27m^3$

7) $16a^2 - 24a + 9$

8) $16n^2 - 1$

Find all roots.

9) $x^4 + 3x^2 - 4 = 0$

10) $x^4 - 12x^2 + 27 = 0$

Factor each completely.

11) $21n^3 - 35n^2 - 12n + 20$

12) $8m^3 - 20m^2 + 14m - 35$

Divide.

13) $(r^3 - 11r^2 + 22r + 32) \div (r - 5)$

14) $(7x^3 + 5x^2 + 3x + 3) \div (x + 1)$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

15) $\frac{3}{4}, 2, 3, -1$

16) $3, \frac{3}{4}, 0, -5$

Approximate the relative minima and relative maxima of each function to the nearest tenth.

17) $f(x) = x^3 - x^2 + 1$

18) $f(x) = x^3 - x^2$

Describe the end behavior of each function.

19) $f(x) = 2x^2 + 12x + 16$

20) $f(x) = x^5 - 3x^3 + x + 2$

Simplify. Your answer should contain only positive exponents.

21) $\frac{2 \cdot 2^{-1}}{(2^2)^4}$

22) $\frac{(2^{-2})^{-3}}{2^{-4} \cdot 2^{-1}}$

23) $\frac{(yx^4)^3 \cdot xy^{-2}}{x^2y^2}$

24) $\frac{2a^2b^{-4}}{(2a^3b^{-4})^2 \cdot 2a^3}$

Factor each. One zero has been given.

25) $f(x) = x^3 + 7x^2 + 14x + 8$; -2

26) $f(x) = x^3 + x^2 - 21x - 45$; -3

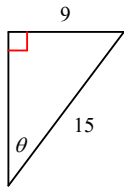
State the number of real zeros.

27) $f(x) = x^3 - 2x^2 + x$

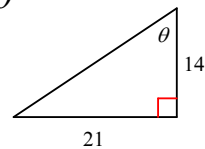
28) $f(x) = x^4 - 8x^3 + 16x^2$

Find the value of the trig function indicated.

29) $\cos \theta$

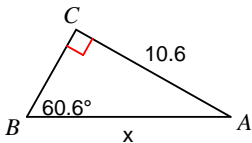


30) $\cos \theta$

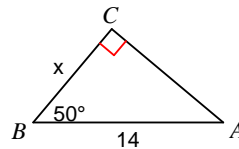


Find the measure of each side indicated. Round to the nearest tenth.

31)

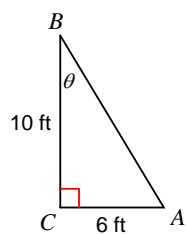


32)

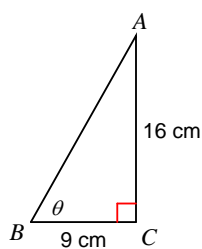


Find the measure of each angle indicated. Round to the nearest tenth.

33)



34)



Find each angle measure to the nearest degree.

35) $\tan Y = 0.6494$

36) $\sin X = 0.9877$

Simplify.

37) $25^{\frac{1}{2}}$

38) $343^{\frac{5}{3}}$

39) $x^4 = 81$

40) $\frac{1}{9}x^5 = 27$

41) $3^{\frac{2}{3}} * 3^{\frac{1}{6}}$

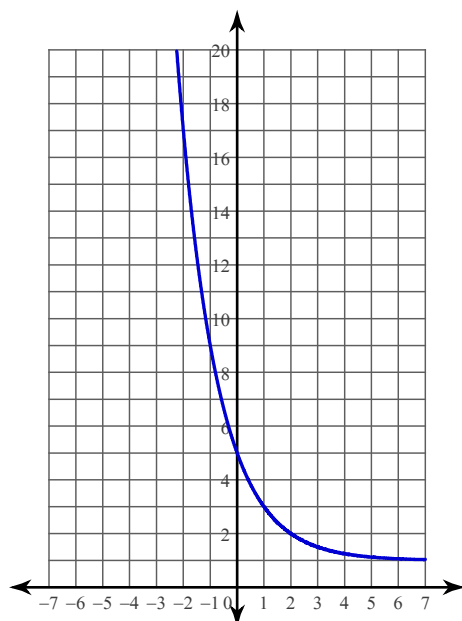
42) $4^{-\frac{1}{6}} * 4^{\frac{1}{3}}$

43) What is the simplified form of $\sqrt[3]{343}$?

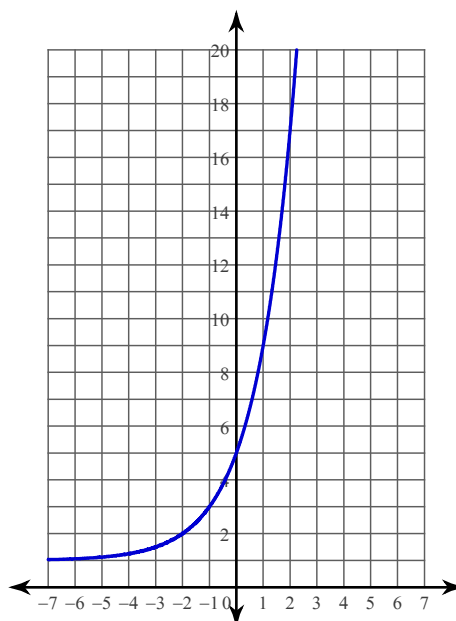
44) What is the simplified form of $\sqrt[4]{80}$?

Write an equation for each graph.

45)



46)



47) Which of the following is/are an exponential growth function?

a. $f(x)=4 \cdot 2^x$

b. $f(x)=4 \cdot \left(\frac{1}{2}\right)^x$

c. $f(x)=4 \cdot \left(\frac{1}{2}\right)^{-x}$

d. $f(x)=4 \cdot 2^{-x}$

49) Suppose you deposit \$1,500 in an account that pays 7% annual interest. What is the balance after 3 years if the interest is compounded annually?

48) Which of the following is/are an exponential decay function?

a. $f(x)=3 \cdot 2^{-x}$

b. $f(x)=3 \cdot \left(\frac{3}{4}\right)^{-x}$

c. $f(x)=3 \cdot \left(\frac{3}{4}\right)^x$

d. $f(x)=3 \cdot 2^x$

50) Suppose you deposit \$21,000 in an account that pays 13.6% compounded quarterly. What is the balance after 4 years.

Find the inverse of each function.

51) $f(x) = \frac{-5x - 20}{8}$

52) $f(x) = -x + 3$

53) What is the simplified form of $\sqrt[4]{\frac{x^4}{y^{12}}}$?

54) What is the simplified form of $\sqrt[6]{\frac{x^{12}}{y^6}}$?

55) In how many ways can 15 dogs place first, second, and third?

56) In how many ways can 13 dogs place first and second?

57) How many different license plates are possible if 3 digits are followed by 3 numbers?

58) How many different license plates are possible if 3 digits are followed by 2 numbers?

59) How many distinguishable permutations of the word POPSICLE are there?

60) How many distinguishable permutations of the word MISSISSIPPI are there?

61) What is the probability of drawing a red card from a standard 52-card deck?

62) What is the probability of rolling a prime number if you roll a fair six-sided die with sides numbered 1 through 6?

- 63) A marble rolled onto a square region of side 7 is equally likely to stop anywhere in the region. Inside the square there is red square of side 2 and a green square of side 3. What is the probability the marble will land in the green square?
- 64) A marble rolled onto a square region of side 7 is equally likely to stop anywhere in the region. Inside the square there is red square of side 2 and a green square of side 3. What is the probability the marble will not land in the red or green square?
- 65) You have an equally likely chance of choosing any letter in the word POPSICLE. What is the probability that you choose a letter that come before L in the alphabet?
- 66) You have an equally likely chance of choosing any letter in the word MISSISSIPPI. What is the probability that you choose a letter that come before M in the alphabet?

Sem 2 Exam Review

© 2012 Kuta Software LLC. All rights reserved.

Simplify each expression.

$$1) (3 - 3x^4 + x^2) + (2x^3 - 2x^2 + 3x^4)$$

$$2x^3 - x^2 + 3$$

$$2) (4p - 3p^2 + 3p^4) - (p + 4p^4 - 8p^2)$$

$$-p^4 + 5p^2 + 3p$$

State the degree and leading coefficient.

$$3) 6m^2$$

$$\text{LC}=6, n=2$$

$$4) -8x^5$$

$$\text{LC}=-8, n=5$$

Factor each completely.

$$5) 128 - 2x^3$$

$$2(4 - x)(16 + 4x + x^2)$$

$$6) 64 + 27m^3$$

$$(4 + 3m)(16 - 12m + 9m^2)$$

$$7) 16a^2 - 24a + 9$$

$$(4a - 3)^2$$

$$8) 16n^2 - 1$$

$$(4n + 1)(4n - 1)$$

Find all roots.

$$9) x^4 + 3x^2 - 4 = 0$$

$$\{2i, -2i, -1, 1\}$$

$$10) x^4 - 12x^2 + 27 = 0$$

$$\{\sqrt{3}, -\sqrt{3}, -3, 3\}$$

Factor each completely.

$$11) 21n^3 - 35n^2 - 12n + 20$$

$$(7n^2 - 4)(3n - 5)$$

$$12) 8m^3 - 20m^2 + 14m - 35$$

$$(4m^2 + 7)(2m - 5)$$

Divide.

$$13) (r^3 - 11r^2 + 22r + 32) \div (r - 5)$$

$$r^2 - 6r - 8 - \frac{8}{r - 5}$$

$$14) (7x^3 + 5x^2 + 3x + 3) \div (x + 1)$$

$$7x^2 - 2x + 5 - \frac{2}{x + 1}$$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

$$15) \frac{3}{4}, 2, 3, -1$$

$$f(x) = 4x^4 - 19x^3 + 16x^2 + 21x - 18$$

$$16) 3, \frac{3}{4}, 0, -5$$

$$f(x) = 4x^4 + 5x^3 - 66x^2 + 45x$$

Approximate the relative minima and relative maxima of each function to the nearest tenth.

$$17) f(x) = x^3 - x^2 + 1$$

$$\text{Minima: } (0.7, 0.9)$$

$$\text{Maxima: } (0, 1)$$

$$18) f(x) = x^3 - x^2$$

$$\text{Minima: } (0.7, -0.1)$$

$$\text{Maxima: } (0, 0)$$

Describe the end behavior of each function.

19) $f(x) = 2x^2 + 12x + 16$ $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$ $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

20) $f(x) = x^5 - 3x^3 + x + 2$ $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$ $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

Simplify. Your answer should contain only positive exponents.

21) $\frac{2 \cdot 2^{-1}}{(2^2)^4} \cdot \frac{1}{2^8}$

22) $\frac{(2^{-2})^{-3}}{2^{-4} \cdot 2^{-1}}$
 2^{11}

23) $\frac{(yx^4)^3 \cdot xy^{-2}}{x^2y^2} \cdot \frac{x^{11}}{y}$

24) $\frac{2a^2b^{-4}}{(2a^3b^{-4})^2 \cdot 2a^3} \cdot \frac{b^4}{4a^7}$

Factor each. One zero has been given.

25) $f(x) = x^3 + 7x^2 + 14x + 8$; -2
 $f(x) = (x + 4)(x + 1)(x + 2)$

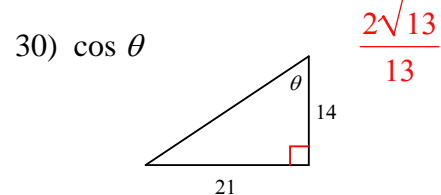
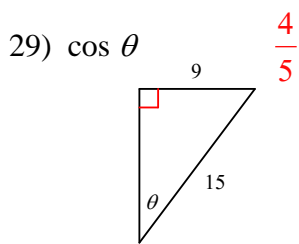
26) $f(x) = x^3 + x^2 - 21x - 45$; -3
 $f(x) = (x - 5)(x + 3)^2$

State the number of real zeros.

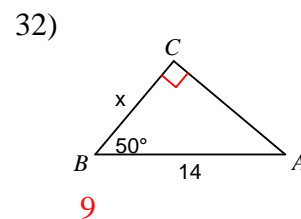
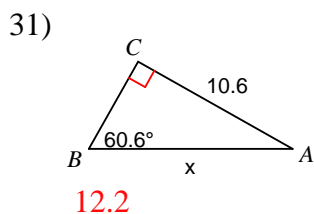
27) $f(x) = x^3 - 2x^2 + x$
 2

28) $f(x) = x^4 - 8x^3 + 16x^2$
 2

Find the value of the trig function indicated.

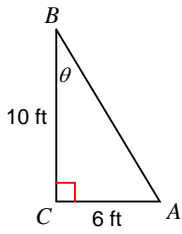


Find the measure of each side indicated. Round to the nearest tenth.



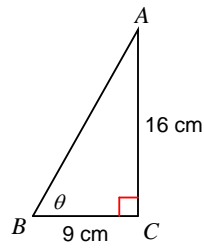
Find the measure of each angle indicated. Round to the nearest tenth.

33)



31°

34)



60.6°

Find each angle measure to the nearest degree.

35) $\tan Y = 0.6494$

33°

36) $\sin X = 0.9877$

81°

Simplify.

37) $25^{\frac{1}{2}}$

5

38) $343^{\frac{5}{3}}$

16807

39) $x^4 = 81$

$-3, 3$

40) $\frac{1}{9}x^5 = 27$

3

41) $3^{\frac{2}{3}} * 3^{\frac{1}{6}} = 3^{\frac{5}{6}}$

42) $4^{-\frac{1}{6}} * 4^{\frac{1}{3}} = 4^{\frac{1}{6}}$

43) What is the simplified form of $\sqrt[3]{343}$?

7

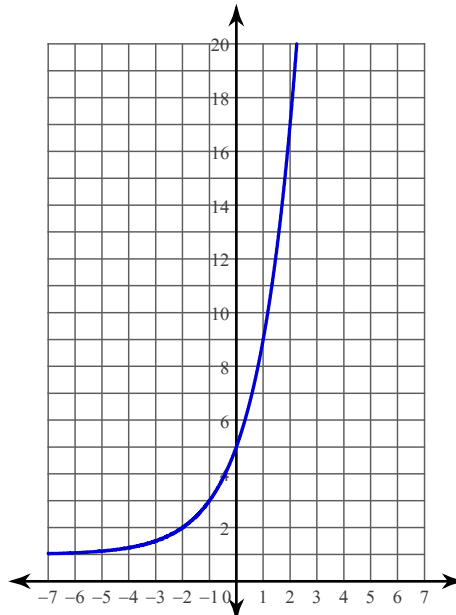
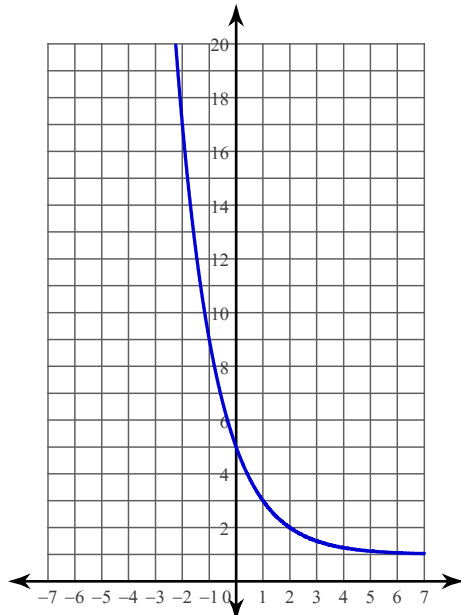
44) What is the simplified form of $\sqrt[4]{80}$?

$2\sqrt[4]{5}$

Write an equation for each graph.

45)

$f(x) = 4 \cdot \left(\frac{1}{2}\right)^x + 4$



$f(x) = 4 \cdot 2^x + 1$

47) Which of the following is/are an exponential growth function?

- a. $f(x)=4 \cdot 2^x$
- b. $f(x)=4 \cdot \left(\frac{1}{2}\right)^x$
- c. $f(x)=4 \cdot \left(\frac{1}{2}\right)^{-x}$
- d. $f(x)=4 \cdot 2^{-x}$

a, c

49) Suppose you deposit \$1,500 in an account that pays 7% annual interest. What is the balance after 3 years if the interest is compounded annually?

\$1837.56

48) Which of the following is/are an exponential decay function?

- a. $f(x)=3 \cdot 2^{-x}$
- b. $f(x)=3 \cdot \left(\frac{3}{4}\right)^{-x}$
- c. $f(x)=3 \cdot \left(\frac{3}{4}\right)^x$
- d. $f(x)=3 \cdot 2^x$

a, c

50) Suppose you deposit \$21,000 in an account that pays 13.6% compounded quarterly. What is the balance after 4 years.

\$35,854.85

Find the inverse of each function.

51) $f(x) = \frac{-5x - 20}{8}$

$f^{-1}(x) = \frac{-20 - 8x}{5}$

52) $f(x) = -x + 3$

$f^{-1}(x) = -x + 3$

53) What is the simplified form of $\sqrt[4]{\frac{x^4}{y^{12}} \cdot \frac{x}{y^3}}$

54) What is the simplified form of $\sqrt[6]{\frac{x^{12}}{y^6} \cdot \frac{x^2}{y}}$

55) In how many ways can 15 dogs place first, second, and third?

2730

56) In how many ways can 13 dogs place first and second?

156

57) How many different license plates are possible if 3 digits are followed by 3 numbers?

17,576,000

58) How many different license plates are possible if 3 digits are followed by 2 numbers?

676,000

59) How many distinguishable permutations of the word POPSICLE are there?

20160

60) How many distinguishable permutations of the word MISSISSIPPI are there?

831600

61) What is the probability of drawing a red card from a standard 52-card deck?

$\frac{1}{2}$, 50%

62) What is the probability of rolling a prime number if you roll a fair six-sided die with sides numbered 1 through 6?

$\frac{4}{6} = \frac{2}{3}$, 67%

63) A marble rolled onto a square region of side $\frac{9}{49}$ 7 is equally likely to stop anywhere in the region. Inside the square there is red square of side 2 and a green square of side 3. What is the probability the marble will land in the green square?

65) You have an equally likely chance of choosing any letter in the word POPSICLE. $\frac{3}{8}$ What is the probability that you choose a letter that come before L in the alphabet?

64) A marble rolled onto a square region of side $\frac{36}{49}$ 7 is equally likely to stop anywhere in the region. Inside the square there is red square of side 2 and a green square of side 3. What is the probability the marble will not land in the red or green square?

66) You have an equally likely chance of choosing any letter in the word $\frac{4}{11}$ MISSISSIPPI. What is the probability that you choose a letter that come before M in the alphabet?